ACCIDENTAL CYTOTOXIC EXPOSURE OF PAEDIATRIC PATIENTS, RELATIVES AND HEALTHCARE STAFF: IMPROVING THE SAFETY OF CYTOTOXIC SYRINGES

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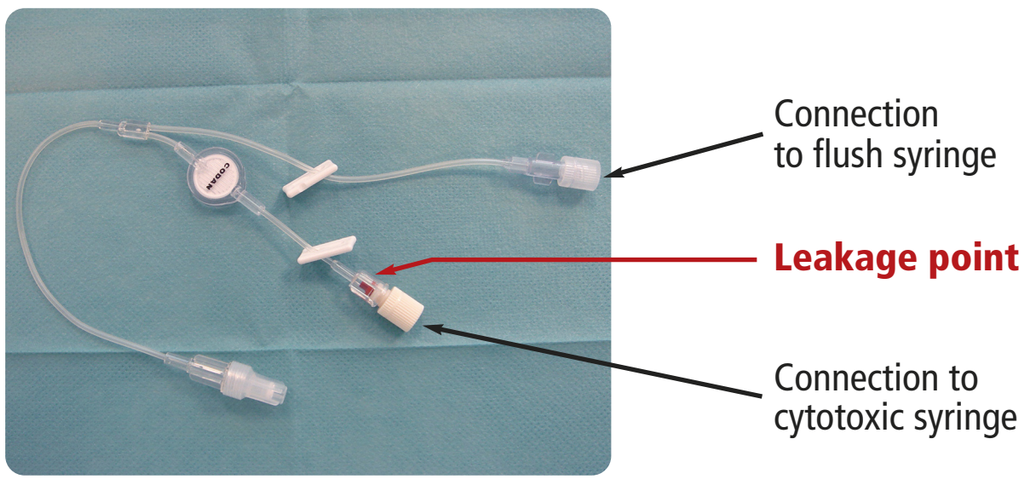
INTRODUCTION

In paediatric patients treated for various cancers, cytotoxic drugs are often prepared in syringes in order to minimise injection volumes.

Lawson[1] study demonstrates that antineoplastic drug exposure was associated with a 2-fold increased risk of spontaneous abortion.

As nurses face the risk of hazardous drug exposure during administration, syringes received from pharmacy departments in our facility were secured with specific closed devices from CODAN® (photo).

However, several problems of cytotoxic drug leakage involving these systems were reported to the pharmacists. In each case, a break was observed at the junction between the tube which connects to the cytotoxic syringe and the non-return valve (red arrow).



Bolus Adapter Set

As the safety of staff and patients was not guaranteed, it was decided to test another device, **the BD PhaSeal™ system, which is shown to reduce occupational exposure of healthcare personnel to hazardous drugs and protect patients from microbiological contaminations. The objective was to assess this new device on both safety and technical criteria.**

1. Lawson CC, Rocheleau CM, Whelan EA, et al. Occupational exposures among nurses and risk of spontaneous abortion. Am J Obstet Gynecol 2012;206:327.e1-8

MATERIALS AND METHOD

We tested two components of the BD PhaSeal™ System:

- The BD PhaSeal™ Injector: a closed system drug transfer device attached to the syringe.
- The BD PhaSeal™ Connector C80: an Y-site extension tube primed with the solvent (NaCl 0,9% or D5%).

- The double membrane feature on both devices ensures leak-free administration.
- Nurses from the haematology unit were requested to undertake the tests and complete a survey on both technical and security criteria.
- The new device was subjected to the same conditions as the previous device: refrigerated storage & continuous infusion of drugs…

RESULTS

- After a short period of training and familiarisation, 18 nurses tested the new system in real life conditions.
- No breaks or leaks were reported with the new system.
- The subsequent scores were in favour of the new system →
- 17/18 nurses agreed to change to the new device.
- The short length of the C80 extension line may be compensated with the use of an additional line.

Criteria	Mean score	Comments
Security	2.5/3	*Both the closed and dry leakproof connections of BD PhaSeal™ was appreciated for the safety feature*
Manipulation	2.2/3	*The main inconvenience was the short length of the extension line*

DISCUSSION AND CONCLUSION

The management of risks related to hazardous drug exposure is an important concern for healthcare professionals.

The number and analysis of the incidents involving the CODAN® system highlighted a defect in this administration device. All the incidents were declared to the manufacturers laboratory who in turn did not detect any manufacturing defect.

According to the manufacturer, the refrigerated storage and the weight of the syringes have weakened the device. No further solution was proposed and it was obvious that their device was not adapted to our practices.

Our perceived difficulty was that few devices are available to secure syringes containing cytotoxic drugs. The BD PhaSeal™ system is frequently used to secure the preparation of anticancer drugs. Furthermore, it was the first device to meet the criteria of a "closed system transfer device" set by the National Institute for Occupational Safety and Health (NIOSH) and the International Society of Oncology Pharmacy Practitioners (ISOPP) and the first device to meet the FDA criteria for the newly established ONB code.

To our knowledge, we are the first teaching hospital in France using the BD PhaSeal™ System to administer intravenous cytotoxic drugs via syringe pumps.

Since this device was subsequently introduced into routine use, the safety of cytotoxic drug administration was improved without compromising efficiency. However a longer extension tube could be an improvement to the existing extension line.